HONDA GX 160 - TECH MANUAL

HONDA CLAIM RULE-FOR GX160 USAC TYPE ENGINES

1. Claims will be from within the same division of class only, I.E.x Jr. Sr. Lt. Hvy. 120 160 – Only competitors in the same division may make a claim on an engine. No claiming in Novice class. One claim, per race event, per handler, per class.
2. Engines may be claimed for $550.00 cash only. No claim related inspection will be started prior to the funds being posted with proper official.
3. This claim form must be submitted to the Race Director, or his or her designee, before the end of the race that the claimed engine is participating in I.E. Checkered flag lap complete.
4. The Race Director, or his or her designee, will hold the claim money until the claimed engine has been inspection for legality.
5. The claimed engine will be tagged/marked and sealed as soon as it comes across the scale.
6. The claimed engine will be immediately taken to impound and or presented to the tech director for inspection. Engine must remain in impound and in the possession of tech officials throughout the entire process including shipping to National Tech Director and the transferring of funds.
7. Inspection of claimed engine MAY NOT be waived by any party.
8. Both claimer and claimee have the option to be present at the time of inspection.
9. Any claim that is withdrawn will be assessed a $50.00 fee that will be paid to the host club.
10. Multiple claims on an engine will be decided via a lottery system. Owner, handler or family member cannot claim his or her own engine.
11. Claimed party will retain air filter, exhaust system and throttle linkage.
12. If the claimed engine is found to be illegal, the motor must be completely torn down to check for additional illegalities. The Tech director must confiscate ALL illegal parts and relate parts from the claimed engine and shall immediately forward them to the National Tech director using confiscation form. Claiming party has the option to accept the engine, as is, less confiscated parts or void the claim if engine is found illegal and claim money will be returned to the person filing the claim.
13. Refusal of claim, destroying or withholding of parts, or any other lack of cooperation in this claim or inspection process will be interpreted as an admission that the engine is illegal and will subject the driver and handler to the conditions set forth in the Honda Suspension Program.
14. Any claimed Honda engine, part or parts which are deemed to be at maximum wear limits is subject to confiscation but not DQ' able. The claiming party has the option to void the claim with no financial penalty.
15. Note: Reference to Wear Limits in "***Engine Block Internal***" of both Honda Manuals.

HONDA SUSPENSION

1. Handlers and drivers guilty of having a Honda engine declared illegal at technical inspection shall be disciplined as follows:
   .A First offense – 30 day suspension for handler and driver from participating in the respective Honda class.
   .B Second offense within one year of first infraction – one year suspension for handler and driver from participating in the respective Honda class.
   C Third offense within two years of last infraction – suspended for life from USAC.
2. Suspension will begin immediately, (unless there is an appeal) at which point the illegal part's will be sent within five days to the District Tech Director or designee for review. If the part's are found illegal at this point the suspension will start at that time by the District Tech notifying the person. Verified illegal parts will be sent to the National Tech Director, legal parts will be returned to person.
3. Suspension for life is open to review by the USAC National Board.
4. For the purposes of this rule only, if a handler has multiple cars competing in the Honda class (GX 120 or GX 160) at one race event and more than one engine is found to be illegal at that event, it will be considered to be one offense.

5. Refusal of tech shall be interpreted as an admission that the engine is illegal and a suspension from the Honda class will be immediate with all awards, qualifications being revoked.
6. Confiscation of part or parts – only the illegal part and all related parts and not the whole motor will be confiscated. A full motor tear down is required if an illegal part is found.
7. **Novice Honda**:
The novice program and its implementation fall under the District Directors. Therefore illegal Honda engine parts will be confiscated but the suspension will not be levied against handlers or drivers for the first offense only.

GENERAL RULES

1. Only stock Honda GX160K1 HX2 and HX26* engine and gearbox will be used in this class. All parts will be stock Honda specifically made for the Honda GX160OK1 HX2. U.S. # GCAAK – Canada # GCABT
   A. All 160 Honda engines must be updated to the new E2 Style piston and cylinder head.
   B. Failure to update + DQ and **minimum 6 month suspension.**

All stock Honda parts must be used and properly installed with the following exceptions:

A. Governor system may be partially or fully removed with the exception of the steel drive gear on the crankshaft. This gear must remain intact. If shaft is removed, hole must be plugged. Hole can be tapped for thread or epoxy. No welding.

B. Factory air cleaner must be removed. Any air filter may be attached to the outside of air filter adapter. Outer wear style or equivalent can be used over carburetor only with no adapter. The approved air filter adapter may be run with or without an air filter. Any air filter may be used with adapter as long as there are no devices inside the air filter or adapter. (I.E. Springs not allowed) hose from valve cover must go into a catch can. WWe are using "outerwear" to define a style not brand name).
   1. The use of air filters during qualifying at asphalt and dirt events is illegal. The Senior Tech Official reserves the right to allow filters at any event that it's deemed necessary.

C. Stock Honda fuel tank must be removed.

D. Recoil starter must be removed. Pull cup may be cut down for washer. Must use original cup.

E. Exhaust: Stock Honda muffler will be removed. Mounting flange may be cut off of muffler and used as adapter flange. Any transition from the "D" shape of the exhaust port to round must take place with in the thickness (0.250"max.) of the flange. This applies to all exhaust systems. No steps or tapers allowed grind marks are allowed past .25" flange area. No suspension for exhaust flange or pipe infraction just disqualification. If an after market flange is used, maximum allowable flange thickness will be 0.250". if slip on type flange assembly is used, pipe stub will be a maximum 0.880" outside diameter tubing with a maximum overall length of 1.500". Pipe stub must be inserted into exhaust pipe at least 0.750" and will have minimal exhaust leakage. Muffler to be used will be 4 to 8 hp Briggs & Stratton, part number 294599 or equal equivalent. Muffler will be internally altered except that the round cup shaped baffle may be welded to the perforated baffle without moving it's original location. Threads will not be removed from muffler. Exhaust pipe will be a maximum of 1.000" outside diameter with a length of 20.0" to 26.0" including a threaded pipe coupler to welded to the end of the pipe in order to screw muffler in place so that muffler may be removed for inspection. Pipe coupler will be a standard, unaltered, ¾" NP, threaded coupler. Length will be 1.000" minimum to 2.250" maximum. There will be no steps or tapers in exhaust pipe or flange assembly. Exhaust pipe length will be measured by using a small diameter hose inserted though pipe to measure over all length. Flange and coupler will be included in the overall length when measuring pipe. No coating of any type may be applied to the interior of any part of the exhaust system. The intent of this rule is to have all of the exhaust pass through the muffler. All measurements are to be taken with the component pieces in the same position as they were installed and on the car.
   1. All USAC .25 midget mufflers must be Briggs & Stratton Part # 294599 or equivalent. No drilling holes in the baffles. Inside seam of baffle must be straight edged. (NOTE: Some seams may not be parallel in baffle). You cannot cut off the threaded flange if it is to be used in Honda. It is Ok to weld a washer or nut on the flange for a place to apply safety wire.

F. Choke butterfly & shaft must be removed. Hole may be filled only with silicone. Old shaft may be cut down.

G. Oil level switch may be disconnected but switch assembly must remain intact in crankcase.

H. Gearbox may be rotated to any desired position.

I. Main jet in carburetor may be a maximum of #82 (0.033) nogo).

J. Off-On ignition switch may be removed, and hole covered. (any material; no welding)

K. All pin measuring gauges are plus tolerance.

L. Exhaust oxygen sensor or temp. sensor attached to any part of Honda exhaust system is illegal.

M. Valve seals are illegal.

N. Cryogenics of any Honda part is illegal.

O. Note; Taking parts out of service reference to "Wear Limits" in Engine block Internal section.

P. DQ only – Not suspension for: Exhaust, Air Filter Adapter, Spark Plug.

Q. Shroud must be factory RED or BLACK.

TECH PROCEDURE

Modifications or machining of any parts in order to bring them to stated minimum or maximum specs (blueprinting) is no legal.

1. External visual check of engine for required components: muffler, shrouds and sheet metal, oil level sensor (this can be partially observed from outside).

NOTES:

Factory air cleaner must be removed. Any air filter may be attached to the outside of air filter adapter. Outer wear style or equivalent can be used over carburetor only with no adapter. The approved air filter adapter may be run with or without an air filter. Any air filter may be used with adapter as long as there are no devices inside the air filter or adapter. (I.E. Springs not allowed) Hose from valve cover must go into a catch can. (We are using "outerwear" to define a style not brand name).

1. The use of air filters during qualifying at asphalt and dirt events is illegal. The Senior Tech. Official reserves the right to allow filters at any event that it's deemed necessary. Senior Tech. Official reserves the right to allow filters at any event that it's deemed necessary.

B. Any type throttle linkage may be utilized. Carburetor will be unaltered with the exception of the black plastic piece on upper end of throttle shaft, this is the only part in the carburetor that can be altered, and #82 maximum jet size.

C. Rear mounting brackets for Honda fuel tank may be removed.

D. The starter cup that is behind the flywheel retaining nut can be cut away to leave only the flat washer back piece that retains cooling fan.

E. The keyed end of the ring gear shaft may be shortened, drilled and tapped or machined for snap.

F. Heli-coiling threads for shrouds (all), valve cover, existing throttle mounting holes, oil drain, and fills holes, one of the coil bolts, and side cover bolts is allowed. Dowel holes are not to be modified or relocated, also one carburetor mounting bolt.

G. Honing and deglazing of the bore is allowed.

H. Lapping the valves is allowed.

I. Blocking Airflow: No device may be used that will/or appear that it may impede airflow into the engine cooling system. This may require that the engine be run at a speed above idle by the tech personnel at the scale after the car has qualified or raced.

CARBURETOR

Remove Carburetor:

A. Check for any alterations or worn parts that would allow additional air into engine: holes, slots, perforations, spacers, loose bolts, warped flanges etc.
   a. Gasket thickness: 0.025" maximum.
   b. Insulator gasket thickness: 0.025" maximum.

B. Carburetor identification number: BE 65 B

C. Check carburetor for alterations. Upper choke shaft hole may be sealed with silicone type sealer.

D. Carburetor Bore: Intake end: Maximum diameter 0.951" ref.
   Throttle end: maximum diameter 0.710.

E. Carburetor venture bore; 0523- no/go. This measurement is best made with a no go gauge but may be made using a telescoping gauge as a no go.

F. Main jet and main nozzle: (MUST BE TIGHT)

Main jet size: maximum #82 – 0.033 no/go.
Main air jet: 0.0587" maximum #53 (0.095") no go- at back of hole.
Main jet access passage: 0.0942" maximum #41 (0.096") no go.
Main nozzle:

1. Main nozzle bore 0.0732" maximum #47 (0.078") no go.
2. Main nozzle will be checked with a no/go gauge (0.424") if gauge goes over dump tube – carb is illegal.. this is best measured using a 0.452" rod type gauge with a 0.424" flat area to be used as a go gauge.
3. Air vent holes on the side of the main nozzle must not be plugged.
4. Main nozzle must not be fastened into the carburetor body by anything other than the main jet. It must not be epoxied or positioned by any other means.

G. Slow Speed system:

1. Pilot jet: 0.0135" maximum #79 (0.0145") no go.
2. Pilot air jet: 0.0478" maximum #55 (0.052") no go
3. Pilot screw: no spec
4. Pilot seat diameter; 0.0365" maximum #63 (0.037") no go.
5. Tip of pilot screw; 0.020" minimum

H. Float bowl Vent: 0.118" maximum #31 (0.1200") no go.

I. Needle valve seat. 0.0685" maximum #31 (0.1200") no go.

J. The butterfly screw, the butterfly, and the throttle shaft must not be removed from the carburetor. Any evidence of tampering will be a disqualification and suspension.

K. Decimal equivalents of numbered size drills chart on page 20.

ENGINE COOLING SHROUDS

A. All pieces of the stock engine-cooling shroud must be properly installed.
B. There must be no addition or subtraction of any material from the shrouding except for the covering of the switch hole. (any material). Starter cup may be altered to be used as washer retainer for the fooling fan.
1. Remove engine-cooling shrouds. Remove valve cover.
2. Zero dial indicator after exhaust bump. (0.050) ref.
3. Maximum valve lift will be checked from the top of valve spring retainer. Valves may be adjusted to zero clearance or shims may be installed to create zero clearance. This may dictate making special shims, as it is difficult to insert feeler gauge blades so as not to interfere with indicator contracts on retainer.

Valve lift:
Intake: 0.245 maximum
Exhaust: 0.255 maximum

CYLINDER HEAD, HEAD GASKET, VALVES, SPRINGS

Remove cylinder head.

Head gasket thickness: 0.040" minimum thickness of inner rim.

Measure from head surface to top of valve head:

Intake:	maximum 0.262"	minimum 0.242"
Exhaust:	maximum 0.250"	minimum 0.225"

This is best done with a depth micrometer or a bridge type dial indicator. Bridge type does not require removing carbon from head surface. See photo on next page.

Combustion chamber cc: 17.2 cc. Ref. with stock spark plug

Remove valves:
Retainer:
A. Inspect retainers for alteration that would increase valve spring pressure. Both intake and exhaust must have stock Honda retainers. Exhaust valve only can have lash cap and corresponding retainer.
B. Thickness of retainer will be: Intake: 0.228" minimum Exhaust: 0.241" minimum
C. Flange thickness of retainer will be: Intake: 0.110" maximum Exhaust: 0.070" maximum
D. From flat of flange to machined surface: Intake: 0.148" minimum Exhaust: 0.165" minimum
E. All valve oil seals must be removed
1. The use of valve seals is illegal and will result in applicable suspension per Honda suspension program.

VALVE SPRINGS

Valve springs will be stock Honda springs and will not be altered in anyway.

<u>160 Spring</u>
A. Wire diameter; 0.071" maximum
B. Outside diameter of spring: 0.790" maximum
C. Number of total coils: 5.3
D. Spring pressure: 11lbs max at 0.812"
E. Stacked length will be: 0.394" maximum

<u>140 Spring</u>
A. Wire diameter: 0.079" maximum
B. Outside diameter of spring: 0.808" maximum
C. Number of total coils: 7
D. Spring pressure: 16 lbs max. at 0.812"
E. Stacked length will be: 0.524" maximum

ROCKER ARMS – PUSH RODS – STUDS

Rocker arms will be stock Honda and will not be altered in any way. Rocker arm studs will be stock Honda. They or their mounting position may not be altered in any manner. No heli-coiling of mounting holes. No bending of studs. Push rods will be stock Honda and will not be altered in any way. Push rod length will be 5.257-5.279".

VALVES

A. Check valves for dimensions and weight. Valve seating surface must be factory ground to a single angle only, 45 degrees. There will be no other angles ground on any part of valve. Valves must not be polished, lightened or altered in any way.
B. Valve weight:
Intake 22 grams minimum
Exhaust 22 grams minimum
C. Drawing of valve dimensions (Intake valve followed by Exhaust valve).

HEAD

Cylinder head will be in "as cast" and in factory machined condition and there must be no addition or subtraction of metal or any other substance to the inside or outside of the cylinder head. This includes no type of machining or grinding to increase compression or airflow. No milling, angle milling etc. or any alteration that could increase valve spring pressure. Note: do not use abrasive material in cleaning head and cylinder deck that will alter factory finish.

A. Measure from flat of head surface down to valve seat. This dimension will be:
Maximum 0.305" minimum 0.287"

B. Measure from surface of head to top of valve guide. This dimension will be: 1.010" maximum

C. Measure from surface of head to lowest machined area in the bowl of the port. This dimension will be:
Intake: 1.062 1.170" maximum
Exhaust: 1.103 1.122" maximum

D. Thickness of head. This will be measured from valve cover surface to head gasket surface at the side at a position in line with upper intake and exhaust flange bolt.

Maximum	2.917"
Minimum	0.911"

INTAKE AND EXHAUST PORTS

A. Ports will be in "as cast" and factory machined condition and there must be no addition or subtraction of metal or any other substance to the inside or outside of the cylinder head.
B. No alterations of any kind to be made to the intake or exhaust port.
C. This includes any grinding, polishing, etching, sand blasting or glass beading to interior surface.
E. Intake and exhaust ports at valve:

Intake:	maximum	0.915"	minimum	0.900"
Exhaust:	maximum	0.863"	minimum	0.858"

ENGINE BLOCK

This engine block must be in "as cast" and factory machined condition. There must be no addition or subtraction of metal or any other substance to the inside or outside of the cylinder block, crankcase cover, crankshaft, rod, piston, pin, rings, flywheel or coil with the following exceptions:

A. Removal of rear gas tanks brackets is permitted.
B. Removal of governor. Governor system may be partially removed with the exception of the steel gear on the crankshaft. This gear must remain intact. Governor arm and shaft may be removed, tied forward or altered to accommodate throttle linkage or return springs.
C. Addition of brackets, fittings etc. to accommodate throttle linkage, tachometer, temperature gauge is allowed.

Check Bore: 2.681" maximum
NOTE: All measurements taken at top of bore or very bottom of bore.

"Wear Limits/Parts Out of Service" USAC reserves the right to confiscate 160 Honda engine parts deemed illegal or at USAC maximum wear limits. EXAMPLE: cylinder bore will be 2.681 max. all measurements taken at top of bore or very bottom of bore parallel to crank, 90 degrees from crank. Any cylinder block that has one measurement over USAC maximum wear limits will be taken out of service. If no measurements exceed USAC maximum wear limits the part of block will not be confiscated. Handler has the right to have confiscated parts returned to them but will be rendered unusable

Check stroke: 1.778 maximum to 1.778 maximum to 1.758" minimum

Measure amount that piston is up or down from block surface at T.D.C. this will be measured at edge or highest part of piston not in center or relieved area.
This dimension will be: 0.000" Maximum NO PISTON POP UP

Install degree wheel on flywheel. Install pointer in order to read degrees. Locate accurate T.D.C. This should be done with a positive stop type fixture and and not established with indicator alone.

Cam will be checked with indicator reading off the top end of tappets which will provide zero clearance. The inverted radius of the top of the tappet presents some problem to get accurate readings and to prevent binding of indicator stem. Indicator holder and pistons are very critical in this operation.

Zero indicator on base circle of cam. Be sure that compression release does not affect zeroing exhaust indicator. Zero dial indicator after exhaust bump (0.050) ref.

Turning engine in normal rotation, clockwise facing flywheel, take reading at specified opening. Readings must fall between specified degrees on the following chart.

IN TAKE			EXHAUST		
	Degrees			Degrees	
0.050”	10.5 to 14	ATDC	0.050”	207 to 210.5	BTDC
0.100”	26.5 to 30	ATDC	0.100”	190 to 193.5	BTDC
0.150”	45 to 48.5	ATDC	0.150”	170.5 to 174.5	BTDC
0.180 Split”			0.180 Split”		
0.200”	71 to 74.5	ATDC	0.200”	144 to 148	BTDC
Maxlift .227”	Peak 104-107	ATDC	Maxlift .229”	Peak 107.5-110.5	BTDC
0.200	136 to 141	ATDC	0.200	70.5 to 73.5	BTDC
0.180 Split			0.180 Split		
0.150”	162.5 to 167	ATDC	0.150”	44.5 to 47.5	BTDC
0.100”	180.5 to 185	ATDC	0.100”	26 to 29.5	BTDC
0.050”	197.5 to 201	ATDC	0.050”	9 to 12.5	BTDC

Check max lift at intake and exhaust.

FLYWHEEL,FAN AND IGNITION SYSTEM

Caution should be used when removing flywheel. Do not hit with hammer or other heavy objects. Service manual show flywheel to be removed with commercially available 6” puller. Another method is inertia type knocker that threads onto crankshaft end.

The transistorized magneto ignition is fixed at 25 degrees BTDC and may not be altered in anyway. Firing must not exceed 0.104” or 26 degrees BTDC.

Quick check: turning flywheel clockwise if the leading edge of the depression of flywheel rim where the magnet is mounted is not still under the right hand coil leg at .115” BTDC, it is probably illegal and should be checked further. If timing needs to be checked further see page 19.

A. Flywheel keyway or its position must not be altered.
B. Key may not be deleted or altered in any way.
C. Magnet retaining screw may not be altered in any way.
D. Magnet retaining screw may not be altered in anyway. Screw may not be replaced with larger or smaller screw. No heli-coiling of mounting hole.
E. Ignition coil or its position, other than air gap, may not be altered in anyway. Coil mounting bolts must be stock and cannot be altered in anyway to advance or retard timing. Coil attaching bolts will be stock 6mm cap screw 1-1/16” long. There can be no more than 3/8” of unthreaded portion of bolt that does not measure 0.230” diameter. This restricts movement of coil to a position that could make ignition timing illegal. If a coil support mount becomes stripped, it is permissible to heli-coil. However, only one leg may be repaired, if both legs are heli-coiled, the crankcase becomes illegal.
F. All nylon blades on the cooling fan must be intact.
G. No metal may be added or removed from the flywheel.
Flywheel weight will be: 2390 grams minimum
H. Flywheel diameter magnet 6.
I. A stock Honda spark plug cap, (wire end at resistor), must be used.
J. Any automotive type spark plug with ¾” reach maximum is allowed.
K. No plug indexing washers allowed.
L. if temperature sensor is used under spark plug, factory washer may be removed.

GEAR BOX AND RING GEAR

A. Gear box may not be altered in anyway. May be rotated to desired position.
B. Ring gear may not be altered in anyway with the exception of keyed end of shaft that may be shortened, drilled and tapped or machined for snap ring grove. No other machining, drilling, grinding etc. to ring gear. Keyway may be cut deeper.
C. Ring gear may not be altered in anyway including polishing or use of any compound or abrasive on gear shaft where bearings ride.

CRANKCASE COVER

Remove crankcase cover

A. Cover must be in “as cast” and factory machined condition and there must be no addition or subtraction of metal or any other substance to crankcase cover.

B. Crankcase cover gasket must be stock Honda. Only one gasket may be installed with a maximum thickness of 0.025”.

Critical dimensions are thrust face of camshaft holder and position of crank bearing. Place a straight edge over crank bearing and cam boss thrust face. These surfaces should be level. Maximum tolerance will be + 0.005”. There will be no alterations to crankcase cover. This excludes any alteration to crank bearing and camshaft holder position and height in an attempt to alter valve timing.

PISTON – WRIST PIN AND PISTON RINGS.

Remove rod and piston- triangle on top of piston must point toward push rods - piston, wrist pin and rings must be absolutely stock and not altered in any manner.

PISTON NOTES

Piston will be stock Honda standard size and will not be altered in anyway.

A. Oversized pistons must not be used.
B. All three piston rings must be used and installed properly.
   1. Top ring: Chrome compression ring installed with "N" on rail up. No expander under ring.
   2. Middle ring: Oil scraper ring installed with "N" or on rail up. No expander under ring.
   3. Bottom ring: Three (3) piece oil rings are allowed.
C. Piston may not be knurled, grooved or coated
D. Total Piston weight: with rings, pin, and clips 200 grams minimum
E. Total piston weight with rings, retainers, and rod, and bolts 360 grams minimum.
F. Minimum total combined weight: 360 grams = (Piston, rings, complete rod w/bolts wrist pins and retainers.)
G. See drawing for dimensions

RINGS

A. Must be stock Honda rings with stock size and configuration.
B. No decreasing of ring tension by heating, machining or any other means.
C. Ring thickness:

Compression:	0.056" min.
Scraper:	0.056" min.
Oil ring:	3 piece oil ring = 0.095 min. 1 piece oil ring = 0.097 min.

WRIST PIN

Stock Honda wrist pin and retainer

OD:	Minimum 0.708"	Maximum 0.709"
Length:	Minimum 2.120"	Maximum 2.128"
ID:	0.556" ref.	
Weight:	40 grams minimum	

CONNECTING ROD

Stock Honda rod with no alterations.

A. Connecting rod big end size: 1.176" minimum- 1.184" maximum
B. Pin end bore is: .710" ref.
C. Length from bottom of pin bore to top of big end bore will be: 2.3755" maximum 2.3580" minimum
D. Rod weight with bolts: 145 grams
E. No oil grooves on bearing surface of either end.

CRANKSHAFT

Stock Honda crankshaft with no alterations.
NOTES:
A. No removal or addition of any metal from or to the crankshaft is allowed.
B. No balancing of the crank is allowed.
C. No oil grooving is allowed on the crank journal.
D. Governor drive gear can not be removed.
E. Crankshaft drive gear should not be removed. This gear is installed by Honda to any accuracy of + ½ degree. If this gear is not installed to this degree of accuracy, engine may not be legal when camshaft is checked by the procedure under engine block.
F. Keyway location must not be altered in any manner.
G. Measure thrust to crank gear side + 3.350 Min.
H. Factory heat treating markings must be present on gear box end of crankshaft and must be evident on all non-contact areas. The only cleaning method allowed is on the flywheel side of crankshaft for the purpose of removing calcium, rust etc. from the exposed end of the crankshaft. This is permitted only from the seal grove out to the end of the thread of the crankshaft where the flywheel bolts on. Only a wire wheel may be used in the cleaning process. The use of Scotchbrite, sandpaper or any other compounds or abrasives is illegal. No material may be added or removed from crankshaft. Crankshaft main journal at flywheel and gearbox ends may not be altered in any way.

Note: Refer to photo of crank color.

CAMSHAFT

Camshaft must be stock Honda with no alteration of any kind.
A. There will be no additions to or subtractions from any part of the camshaft.
B. Compression release will remain intact and unaltered.
C. Love center angle will no be altered by any means.
D. Lobe profile will not be altered in anyway.

CAMSHAFT SPECIFICATIONS

INTAKE		EXHAUST	
Heel to Heel.	0.865"- 0.869"	Heel to Heel	0.866" – 0.870"
Heel to Peak	1.079"- 1.93"	Heel to Peak	1.081" – 1.095"

Length – thrust flange to thrust flange:
3.137" minimum 3.142" maximum
Cam bearings are 0.547" -0.551" and unaltered.

TAPPETS

A. Tappets must be stock Honda with no alterations.
B. Base diameter: 0.910" no maximum spec

C. Stem diameter: 0.312" minimum
D. Base thickness: 0.076" minimum 0.090" maximum
E. Length: 1.181" minimum 1.220" maximum
F. Weight: 16 grams minimum

ENGINE BLOCK INTERNAL

The engine block must be in an "as cast" and factory machined condition and there must be no addition or subtraction of metal or any other substance to the inside or outside of the block.

A. Cylinder bore will be 2.681" maximum.
   1. "Wear Limits/Parts Out of Service" USAC reserves the right to confiscate 160 honda engine parts deemed illegal or at USAC maximum wear limits. EXAMPLE: Cylinder bore will be 2.681 Max. all measurements taken at top of bore or very bottom of bore parallel to crank, 90 degrees from crank. Any cylinder block that has one measurement over USAC maximum wear limits will be taken out of service. If no measurements exceed USAC maximum wear limits the part of block will not be confiscated. Handler has the right to have confiscated parts returned to them but will be rendered unusable.
B. Cylinder bore will not be bored oversize.
C. Cylinder bore will not be re-sleeved.
D. Cylinder bore position will not be moved or tipped in any manner.
E. Cylinder block deck will not be resurfaced by any means. There will be no polishing, sand-blasting or glass beading to any interior surface.
F. Deck Height: 5.123" minimum 5.127" maximum
G. Machined surface of block down to thrust face of cam boss: 3.220" minimum 3.235" maximum
H. Machined surface of block down to bearing face: 3.416" minimum 3.435" maximum
I. Oil level sensor will be intact and unaltered. Wires may be externally disconnected or cut off.

PROCEDURE FOR CHECKING TIMING

A. With degree wheel or indicator located at 0 degrees or TDC.., mark both the flywheel and some fixed point (such as right hand side of aluminum block casting right above flywheel) with aligning marks. Turn the flywheel clockwise and stop at 26 degrees BTDC or 0.103" – 0.104" BTDC on your indicator. Make another mark on the block casting that aligns with your mark on the flywheel.
B. Remove dial indicator so it will not be damaged by engine rotation.
C. Install timing light to a battery, if not self powered, and clamp inductive pickup to spark plug wire. Wire should be hooked to standard spark plug gapped to 0.025". Using a drill, with an extension that is cut off or turned to fit drill, place socket on flywheel nut and rotate engine in clockwise direction.
D. Fire the timing light and observe. If the reference mark on the flywheel is between the two marks on block casting that are TDC and 0.104" or 26 degrees BTDC, the timing is legal. If mark is not between marks on block casting when rotating, the engine will be disqualified.

Tech officials have the right to tech any or all cars in any class at their discretion. Tech officials follow the same chain of command as all officers of USAC as follows: Local- District- National I.E. District tech officials can tech at any event at their District and National Tech officials can tech at any event in USAC. National Tech Director is final authority on all tech issues.

DECIMAL DQUIVALENTS OF NUMBER SIZE DRILLS

No.	Size in Decimals	No.	Size in Decimals	No.	Size in Decimals	No.	Size in Decimals
1.	.2280	21	.1590	41	.0960	61	.0390
2.	.2210	22	.1570	42	.0935	62	.0380
3.	.2130	23	.1540	43	.0890	63	.0370
4.	.2090	24	.1520	44	.0860	64	.0360
5.	.2055	25	.1495	45	.0820	65	.0350
6.	.2040	26	.1470	46	.0810	66	.0330
7.	.2010	27	.1440	47	.0785	67	.0320
8.	.1990	28	.1405	48	.0760	68	.0310
9.	.1960	29	.1360	49	.0730	69	.0292
10.	.1935	30	.1285	50	.0700	70	.0280
11.	.1910	31	.1200	51	.0670	71	.0260
12.	.1890	32	.1160	52	.0635	72	.0250
13.	.1850	33	.1130	53	.0595	73	.0240
14.	.1820	34	.1110	54	.0550	74	.0225
15.	.1800	35	.1100	55	.0520	75	.0210
16.	.1770	36	.1065	56	.0465	76	.0200
17.	.1730	37	.1040	57	.0430	77	.0180
18.	.1695	38	.1015	58	.0420	78	.0160
19.	.1660	39	.0995	59	.0410	79	.0145
20.	.1610	40	.0980	60	.0400	80	.0135

PLEASE NOTE THAILAND BUILT ENGINES ARE NOT PERMITTED IN USAC COMPETITION.